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Wean Dairy Calves Early

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Wean dairy calves early?

Dairy calves can be weaned from milk at 1 month of age by feeding a palatable, nutritious starter. Here's more about the early-weaning program's "secret" — getting the calves on starter at an early age.

by H. H. Van Horn, J. W. Rust, C. F. Foreman and N. L. Jacobson

SOME DAIRYMEN like to wean herd-replacement calves at an early age. This makes more whole milk available for sale, and most farms no longer have liquid skimmilk available.

Interest in early weaning has been stimulated by research indicating that calves can use less liquid feed and more starter (high-quality grain concentrate mixture) and hay at an earlier age than previously thought advisable. Also, fast early calf growth probably isn't of great importance for herd-replacement animals.

Many dairymen now follow a *limited whole-milk* or a *milk-replacer* system for feeding young calves. With either system, a calf receives colostrum (the milk produced by a cow right after calving) for about 3 days after birth and then is fed 275-400 pounds of whole milk or an equivalent amount of milk replacer before weaning at 6-8 weeks of age. If a good starter is provided at an early age, however, a calf can be weaned earlier.

How Early?

At what age can dairy calves be weaned from milk? In one system that seems satisfactory, calves are fed a palatable, nutritious starter—such as that given in table 1—and are weaned at 1 month of age.

Here's a typical feeding schedule for this system:

- From birth to 3 days of age, be sure the calf gets colostrum by nursing its mother or by hand feeding.
- From 4 to 24 days of age, feed daily an amount of whole milk equal to 8 percent of the calf's birthweight. If the calf's birthweight is 90 pounds, for example, feed 7.2 pounds of milk daily (3.6 pounds per feeding).
- From 25 to 31 days of age, feed daily an amount of whole milk equal to 4 percent of the calf's birthweight—just half of the amount for the previous period.

Beginning at 4 days of age, offer the starter free choice until the calf eats 4 pounds per day. Limit the starter to this amount.

Feed good-quality legume or grass-legume hay as soon as the calf will eat it. Make sure that fresh water and salt are available at all times.

To grow properly with this feeding schedule, a calf must learn to eat starter at an early age. A calf usually will eat only a small amount of starter during the first 2-3 weeks of its life. It will eat more as the amount of milk or milk replacer is decreased.

How successful is early weaning?

Research Findings . . .

In tests at Iowa State, Holstein heifer calves weaned at 1 month of age consumed an average of 177 pounds of whole milk per calf during the month and gained an average of 1.3 pounds daily to 12 weeks of age (group 1, table 2).

Another group (group 2, table 2) was weaned at 7 weeks of age. These calves consumed an average

TABLE 1. Calf Starter Formula.

Ingredient	Amount (lbs.)
Coarsely ground corn	40
Crushed or rolled oats	27
Soybean meal	20
Blackstrap molasses	10
Dicalcium phosphate	2
Iodized salt	1
Trace mineral mixture	0.15

Vitamin A: 5,000 IU/lb. of starter.
Vitamin D: 400 IU/lb. of starter.
Antibiotic: 10-20 mg. Aureomycin or Terramycin per lb. of starter.

THE AUTHORS all are members of the staff of the dairy science section, Department of Animal Science.

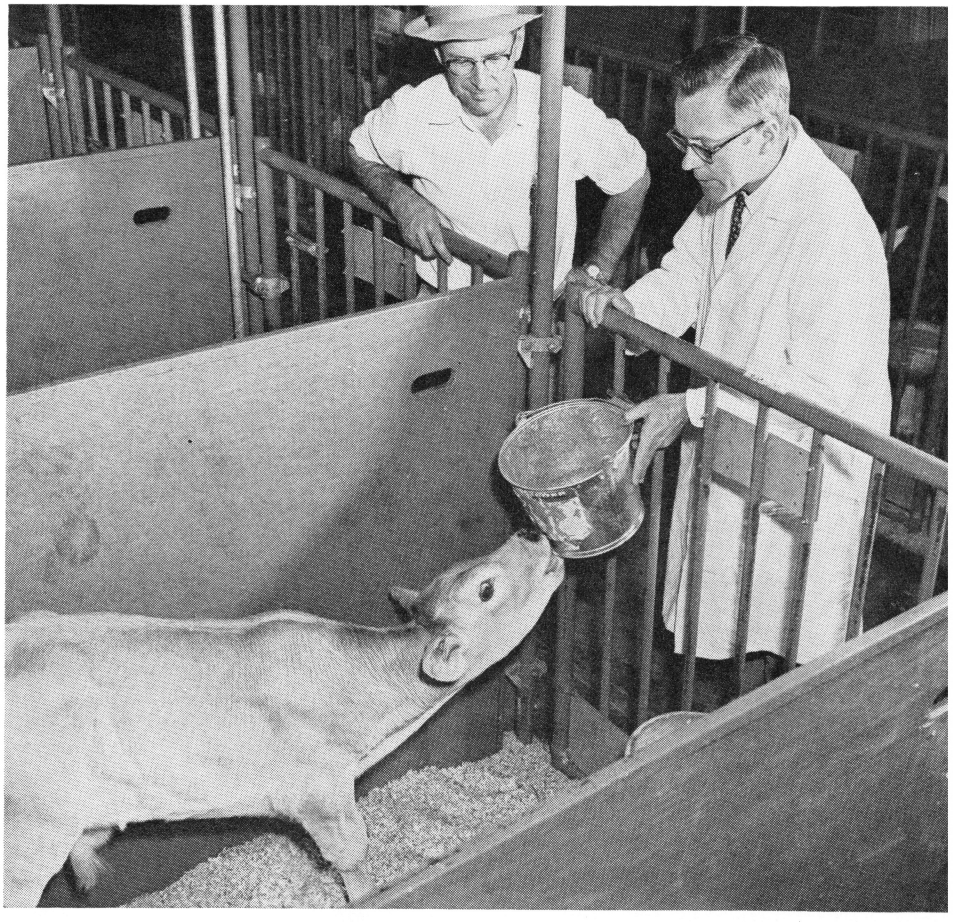

TABLE 2. Body weight gains of female Holstein calves fed three levels of milk.

Group	Milk fed to (days of age)	Total milk per calf (lbs.)	No. of calves	Initial weight (lbs.)	Average body weight gain (in lbs.) to: 2 wks.	4 wks.	6 wks.	8 wks.	10 wks.	12 wks.
1	31	177	28	90	4	18	38	58	82	110
2	52	388	24	91	4	18	40	63	90	119
3	88	966	18	84	8	28	51	80	112	145

TABLE 3. Feed consumption of female Holstein calves fed three levels of milk.[a]

Group	Starter consumption (lbs.)[b] 0-2 wks.	2-4 wks.	4-6 wks.	6-8 wks.	8-10 wks.	10-12 wks.	Hay consumption (lbs.)[c] 0-4 wks.	4-8 wks.	8-12 wks.
1	0.4	1.2	3.2	4.2	5.4	6.5	—	—	—
2	0.3	0.8	1.8	3.2	5.4	7.0	—	—	—
3	0.4	0.8	1.1	1.6	2.5	3.3	0.2	0.5	0.9

[a]See table 2 for milk consumption.
[b]Average consumption per calf per day.
[c]Average consumption per calf per day. Hay offered free-choice to calves in group 3; none fed to calves in groups 1 and 2.

of 388 pounds of milk per calf during the 7-week period and averaged 1.4 pounds daily gain to 12 weeks of age.

Group 3 (table 2) received milk for 12 weeks. These calves were fed an average of 966 pounds of milk per calf during the 12-week period and gained 1.7 pounds per day to 12 weeks.

Starter consumption (table 3) per calf for the 12 weeks averaged 293 pounds for group 1 and 263 pounds for group 2. The difference occurred mainly during the period from 4 to 8 weeks. Starter consumption for group 3 averaged 126 pounds per calf during the 12 weeks.

Group 3 received alfalfa hay, but the calves ate very little. Groups 1 and 2 didn't receive hay in this particular experiment, and, for this reason, the amount of starter wasn't limited.

Calculated total digestible nutrients (TDN) per pound of gain for groups 1, 2 and 3 were 2.2, 2.1 and 1.9 pounds, respectively.

Heifers in groups 1 and 2 were about the same size at 6 months of age. At 1 year, weights of both groups averaged 643 pounds per heifer—about normal size for that age. Weights at 6 months and 1 year weren't available for group 3, but other results indicate that the advantage in gain at weaning time, when compared with groups similar to 1 and 2, disappears by 1 year of age or earlier.

Judging from these results, it appears that calves suitable for herd replacements can be reared with 170-180 pounds of whole milk if fed a high-quality starter and dry feed.

Other research is under way to find whether even lesser amounts of liquid feed might be adequate. In a preliminary test, five Brown Swiss calves, five Jerseys and one Guernsey grew at a satisfactory rate when weaned at 24 days of age. From 4 to 17 days of age, each calf received daily an amount of whole milk equal to 8 percent of the calf's birthweight. From 18 to 24 days of age, each calf was fed daily an amount of whole milk equal to 4 percent of the calf's birthweight. No milk was fed after the calves were 24 days of age. Starter and hay were offered free choice after the fourth day of age.

The Brown Swiss calves consumed an average of 146 pounds of milk per calf during the 24-day period and gained 1.2 pounds daily to 12 weeks of age. The Jerseys and the Guernsey consumed an average of 89 pounds of milk per calf during the 24 days and gained 0.8 pound daily to 12 weeks of age.

In other studies calves were weaned at 21 days of age. Each calf was allowed to nurse once after birth and then was taken from its dam. All milk produced by the dam during the first 4 days after calving was stored and fed to the calf. The dam usually produced enough milk during the first 4 days of her lactation to feed her calf during the first half of the 21-day test period. This milk was supplemented with whole milk so that each calf received an amount of milk equal to 8 percent of its birthweight daily to 14 days of age and 4 percent from 15 to 21 days of age. Growth of calves in this test was similar to the growth of calves weaned at 24 days of age.

Calves were weaned as early as 2 weeks of age, but most of them didn't eat enough starter during the second and third weeks to permit satisfactory growth.

In General . . .

If you feed 175 pounds of whole milk or less per calf, substituting a milk replacer for milk won't greatly reduce feed cost because of the small amount of whole milk replaced. If you can store colostrum—by freezing or by some other method—this milk will furnish the major part of that needed for an early weaning system. If you keep only the heifer calves, the colostrum from an average of two cows will be available for each calf. This amount of milk probably will be adequate for the heifer calves if you use the early weaning system.

Many factors influence the amount of starter that a calf will eat: composition and texture of the starter, amount of other feeds available and the likes and dislikes of the calf.

Calves generally prefer a coarse-textured starter that isn't dusty. Liquid molasses, as used in the starter formula listed in table 1, helps to keep down dust and improves palatability. If the starter is too fine or too dusty as a meal, calves may eat more if it's pelleted into relatively soft pellets. Pelleting probably won't improve a highly palatable meal-type starter.

Regardless of form, calves must eat large quantities of a high-quality starter at an early age if an early weaning system is to be successful. With any good limited-milk or milk-replacer feeding system, the TDN requirement per pound of gain should be about 2 pounds for the first 12 weeks of a calf's life.